The Burden of Injury in Rhode Island:

A State Profile

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INTRODUCTION

Report Overview:

Injuries are predictable and preventable. In order to target prevention accordingly, public health seeks to understand injury patterns among the population. This is done by identifying and analyzing injury indicators captured by population-level data sources. Injury indicators include outcomes, such as motor vehicle crashes, and factors that increase or decrease the likelihood of sustaining an injury, such as motor vehicle occupant safety belt use.

The Rhode Island Department of Health (HEALTH) - Safe Rhode Island Violence and Injury Prevention Program (Safe RI) - received a three-year cooperative agreement in 2002 from the US Centers for Disease Control and Prevention (CDC) to assess and plan for injury prevention in the state. As part of this cooperative agreement, Safe RI was charged with assessing the burden of injury in Rhode Island. In this report, we present information on a number of injury outcomes and risk factors, highlighting patterns in statewide injury hospitalization and death.

This report begins with a broad approach. In the first section, injury is presented among the leading causes of death for Rhode Islanders. Injury is then broken into categories by intent (i.e. intentional, unintentional, etc.) and/or mechanism (i.e. falls, motor vehicle crashes, etc.), and the top causes of injury-related death and hospitalization in Rhode Island are reviewed. Following this section, we discuss the top three leading causes of injury-related death and hospitalization for Rhode Islanders – suicide, unintentional motor vehicle traffic accidents, and unintentional falls – and describe patterns of morbidity and mortality by sex, race, and discrete age groupings for each cause.

Injury Data Sources / Methodology:

Through data sharing agreements, injury morbidity and mortality data were made available to Safe RI from the Office of Vital Records and the Center for Health Data and Analysis at the Rhode Island Department of Health. Injury mortality information from 1999 – 2003 was obtained from computerized death certificates and analyzed utilizing ICD-10 external cause of injury codes. Hospital Discharge Data (HDD), years 1999-2003, formed the basis of our injury morbidity estimates. Injury hospitalizations were identified using ICD-9-CM external cause of injury codes based on all diagnostic fields. Additionally, national injury estimates were obtained from the Centers for Disease Control, National Center for Injury Prevention and Control, WISQARS online data query system.

Although statewide Emergency Department Data collection was initiated in January of 2005, this information was not available for analysis during the development period of this report. It is important to note that less than 5% of non-fatal injuries reported to the health professionals result in hospitalization.[1] Thus, our morbidity estimates only represent a small fraction of the true burden of non-fatal injuries in Rhode Island.

For purposes of this analysis race and ethnicity fields were combined to create a race/ethnicity variable comprised of the following categories – Non-Hispanic White; Non-Hispanic Black; Hispanic; Non-Hispanic Asian / Pacific Islander; Non-Hispanic American Indian / Alaskan Native; and Non-Hispanic Other. Missing and unknown race/ethnicity information is included in the analysis, but is not presented in race/ethnicity tables throughout the report. For injury related hospital discharges during the years 1999 – 2003, 3.5% of the combined race / ethnicity field was either missing or unknown. Among all hospital inpatient discharges between April – December of 2003, 13.7% of patient ethnicity information and 4.9% of patient race information was missing.[14]

Our injury risk factor estimates were derived through secondary analysis of statewide health survey data, primarily the Behavioral Risk Factor Survey (BRFS, 2003) and the Youth Risk Behavior Survey (YRBS, 2003). Additional data sources utilized for secondary analysis include the National Health and Nutrition Examination Survey (NHANES, 2002) and the Fatality Analysis Reporting System (FARS, 2003).

Much of the injury data presented in this report is in the form of crude rates. Denominator information was derived from Rhode Island Census estimates for years 1999 through 2003.[6] Age adjusted rates were computed using the direct method of standardization. Census 2000 national population data provided the standard age distribution. Numerator information for injury death rates includes all Rhode Island residents who died during the years 1999 through 2003, in any of the 50 states or US Territories. Compared to other states, Rhode Island has a relatively high percentage of resident deaths that occur outside of our borders. Just over three percent (3.1%) of Rhode Island resident fatalities during the years 2000 – 2003 occurred out-of-state, primarily in Massachusetts and Connecticut.[4]

For injury hospitalizations, the disposition was restricted to only those patients who survived their injury, to avoid duplicating injury death counts. Included in the injury morbidity analysis were all cases of injury hospitalization occurring in Rhode Island during the years 1999 through 2003. Because injury hospitalization rates were calculated using Rhode Island residency data, estimates may be a slight over or under-representation of the true problem. The percentage of Rhode Island residents seeking treatment for injuries in hospitals out of state is unknown. Therefore, the precision of our injury hospitalization estimates is dependent on the number of state residents treated in Rhode Island hospitals out-of-state being similar to the number of non-residents treated in hospitals within Rhode Island.

Lastly, rates are generally considered unstable when based on numerators of less than 20.[2] Because the population of Rhode Island is just over 1,000,000, absolute numbers of specific injury causes per year are often small.[6] To increase total numbers and stabilize rates, five years of injury data were combined. Additionally, where possible, broader age groups were used. Despite correcting for this problem, certain demographic subgroup numbers still remained too small to produce stable rates. In some cases, rates were calculated based on numerators of less than 20. These cases are noted throughout the report with an asterisk. As a rule, we did not generate rates based on numerators of less than 10. Consequently, rates were not calculated for some demographic subgroups, specifically the race/ethnicity subgroups Asian, Native American and Alaskan Native, and Hawaiian Native and other Pacific Islander. However, absolute numbers and percentages of select causes of injury-related death and hospitalization among all racial/ethnic groups included in this analysis are presented in Tables C, E, G, I, K, and M in the report appendix.

Acknowledgments

We would like to thank the following for their considerable guidance and data contributions.

The Rhode Island Injury Community Planning Group

The Center for Health Data and Analysis, HEALTH

The Office of Vital Records, HEALTH

The following Offices and Programs within the Rhode Island Department of Health: the Office of Chronic Disease Prevention and Health Promotion, the Oral Health Program, the Office of Women's Health - Osteoporosis Program, and the Office of Communicable Diseases

INJURY DATA OVERVIEW

Fatal Injuries in Rhode Island:

Unintentional injury is the leading cause of death for Rhode Islanders between the ages of 1 and 34 (Figure 1). When suicide, homicide, and unintentional injuries are combined, injury becomes the 5th leading cause of death for Rhode Islanders of all ages.[2] Only heart disease, cancer, cerebrovascular disease, and chronic lower respiratory disease kill more Rhode Island residents yearly. Individuals between the ages of 1 – 34 are disproportionately affected by both intentional injury (i.e. homicide and suicide) and unintentional injury (i.e. motor vehicle crashes) death. Within this age group, injuries account for over two-thirds of all mortality statewide.[2]

Injuries are the 5th leading cause of death for Rhode Islanders of all ages.

Figure 1 **Leading Causes of Death, by Age, Rhode Island, 1999-2003**

	Age Groups											
Rank	<1	1-4	5-9	10-14	15-19	20-24	25-34	35-44	45-54	55-64	65+	All Ages
1	Short Gestation 111	Unintentional Injury 12	Malignant Neoplasms 15	Unintentional Injury 14	Unintentional Injury 71	Unintentional Injury 84	Unintentional Injury 133	Malignant Neoplasms 338	Malignant Neoplasms 913	Malignant Neoplasms 1,660	Heart Disease 13,430	Heart Disease 15,319
2	Congenital Anomalies 63	Congenital Anomalies 7	Unintentional Injury 14	Malignant Neoplasms 10	Homicide 31	Suicide 34	Suicide 73	Heart Disease 227	Heart Disease 561	Heart Disease 1,023	Malignant Neoplasms 8,994	Malignant Neoplasms 12,026
3	Placenta Cord Membranes 29	Malignant Neoplasms 7	Homicide 4	Homicide 2	Suicide 20	Homicide 34	Malignant Neoplasms 63	Unintentional Injury 163	Unintentional Injury 126	Chronic Low. Respiratory Disease 175	Cerebro-vascular 2,754	Cerebro-vascular 2,994
4	Maternal Pregnancy Comp. 21	Heart Disease 4	Septicemia 3	Suicide 2	Malignant Neoplasms 10	Malignant Neoplasms 14	Homicide 44	Suicide 113	Liver Disease 119	Diabetes Mellitus 149	Chronic Low. Respiratory Disease 2,261	Chronic Low. Respiratory Disease 2,522
5	SIDS 18	Cerebro-vascular 3	Chronic Lower Respiratory Disease 2	Influenza & Pneumonia 2	Congenital Anomalies 9	Heart Disease 13	Heart Disease 40	Liver Disease 68	Suicide 96	Liver Disease 127	Influenza & Pneumonia 1,422	Influenza & Pneumonia 1,523
6	Bacterial Sepsis 14	Homicide 3	Congenital Anomalies 2	Benign Neoplasms 2	Heart Disease 3	Congenital Anomalies 3	HIV 17	HIV 66	Diabetes Mellitus 78	Cerebro-vascular 120	Alzheimer's Disease 1,268	Unintentional Injury 1,441
7	Circulatory System Disease 14	Benign Neoplasms 2	Five Tied 1	Congenital Anomalies 2	Meningo-coccal Infection 2	Cerebro-vascular 2	Cerebro-Vascular 9	Cerebro-Vascular 42	Chronic Low. Respiratory Disease 63	Unintentional Injury 91	Diabetes Mellitus 1,049	Diabetes Mellitus 1,308

WISQARS™ Produced By: Office of Statistics and Programming, National Center for Injury Prevention and Control, Centers for Disease Control and Prevention
Data Source: National Center for Health Statistics (NCHS), National Vital Statistics System

Between the years 1999 and 2003, 2,479 fatal injuries occurred in Rhode Island, an average of 496 fatal injuries per year.[3] The financial costs of these fatal injuries are staggering – 1.3 billion dollars in health care and social support resources.[3] The estimated cost per case was 1.8 million dollars.[3] This number breaks down as follows: costs of medical care $11.5 thousand; costs of lost productivity $964.7 thousand; and costs of decreased quality of life $807.5 thousand.[3] These estimates do not include the emotional

burden resulting from the loss of a loved one, or the toll of severe disability on the injured person and his/her family.

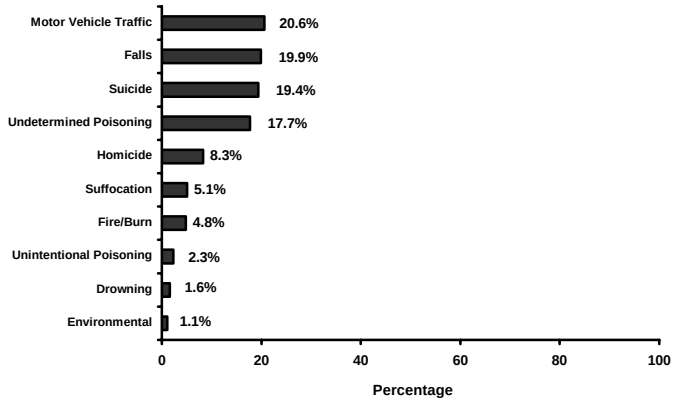
Leading Causes of Injury-related Death:

For purposes of this analysis, injury was collapsed into the following discrete categories: Suicide, homicide, unintentional injury by mechanism, and undetermined injury by mechanism. Overall, unintentional motor vehicle crashes (MVC) are the leading cause of injury-related death for Rhode Islanders for the years 1999 – 2003, accounting for just over 20% of the top ten leading causes of injury fatality (Figure 2). Unintentional falls are the second leading cause of injury-related death in Rhode Island, followed by suicide, undetermined poisonings, and homicide (Figure 2). The top 3 leading causes of injury-related death (MVC, falls, and suicide) combined account for almost 60% of all deaths due to injury in the state.[4]

Racial differences in leading causes of injury-related death are noted in Table 1. For Non-Hispanic Blacks and Hispanics of all ages, homicide is the leading cause of injury- related death (Table 1) and is the leading cause of death overall for Non-Hispanic Blacks and Hispanics between the ages of 1-34.[4] Unintentional falls are the leading cause of injury-related death for Non- Hispanic Whites (Table 1). The five leading causes of injury-related death for Non-Hispanic Blacks and Hispanics are the same, with undetermined poisonings as the 2nd leading cause of injury-related death followed by MVC, suicide, and falls (Table 1). For Non-Hispanic Whites MVC are the 2nd leading

Figure 2

Top 10 Leading Causes of Injury-Related Death, All Ages, Both Sexes, Rhode Island, 1999-2003



Data Source: Rhode Island Vital Statistics Data, 1999-2003; Office of Vital Records / Center for Health Data and Analysis, HEALTH

Table 1

Leading Causes of Injury Related Death by Race

	Non-Hispanic White	Non-Hispanic Black	Hispanic
1	Falls 425	Homicide 47	Homicide 48
2	Motor Vehicle Traffic 387	Undetermined Poisoning 31	Undetermined Poisoning 30
3	Suicide 384	Motor Vehicle Traffic 25	Motor Vehicle Traffic 23
4	Undetermined Poisoning 327	Suicide 20	Suicide 14
5	Suffocation 106	Falls 9	Falls 5

Data Source: Rhode Island Vital Statistics Data, 1999-2003; Office of Vital Records / Center for Health Data and Analysis, HEALTH

Highlights

Unintentional injury is the leading cause of death for Rhode Islanders ages 1 to 34, accounting for over two-thirds of all deaths in this age group.

The top 3 leading causes of injury-related death overall in Rhode Island are motor vehicle crashes, falls, and suicide.

Homicide is the leading cause of injury death for Non-Hispanic Black and Hispanic Rhode Islanders of all ages and is the leading cause of death overall for Non-Hispanic Blacks and Hispanics between the ages of 1-34.

Suicide is the leading cause of injury death for Rhode Island males, whereas falls are the leading cause of injury death for Rhode Island females.

cause of death followed by suicide, undetermined poisonings and suffocation (Table 1).

Gender differences in leading causes of injury death are presented in Table 2. Suicide is the leading cause of injury death for Rhode Island males and the 4th leading cause of death for Rhode Island females (Table 2). Compared to females, males suffer more fatal intentional injuries. Nearly 80% of all suicides and homicides in Rhode Island occur among males.[4] Unintentional falls are the leading cause of death for Rhode Island females (Table 2), with the vast majority of fatalities occurring among women over the age of 75.[4] Motor vehicle crashes and undetermined poisonings are the 2nd and 3rd leading causes of death

Table 2

Leading Causes of Injury Related Death by Sex

	Male	Female
1	Suicide 337	Falls 240
2	Motor Vehicle Traffic 313	Motor Vehicle Traffic 144
3	Undetermined Poisoning 267	Undetermined Poisoning 126
4	Falls 202	Suicide 92
5	Homicide 147	Suffocation 52

Data Source: Rhode Island Vital Statistics Data, 1999-2003; Office of Vital Statistics / Center for Health Data and Analysis, HEALTH

Table 3

Top 3 Leading Causes of Injury Related Death among Rhode Islanders Aged 65+, 1999-2003

	65-74	75+
1	Falls 51	Falls 336
2	Motor Vehicle Traffic 32	Motor Vehicle Traffic 70
3	Suicide 23	Suffocation 67

Data Source: Rhode Island Vital Statistics Data, 1999-2003; Office of Vital Statistics / Center for Health Data and Analysis, HEALTH

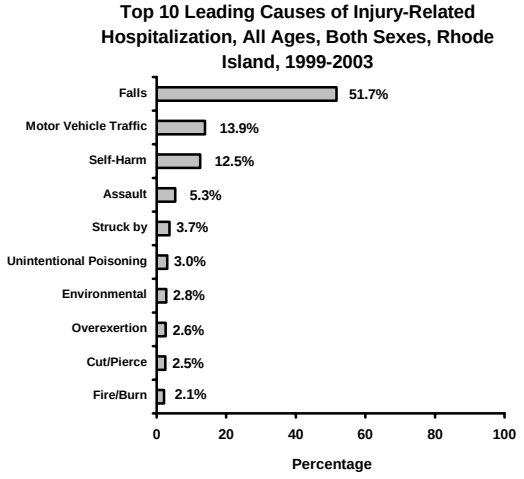
respectively, for both Rhode Island men and women (Table 2).

For youth ages 0 to 24, MVC are the leading cause of injury death, disproportionately affecting males in this age group.[4] Males between the ages of 15 and 24 accounted for 21% of all MVC fatalities in Rhode Island during 1999-2003.[4] For individuals aged 30-49, undetermined poisonings are the leading cause of injury-related death, followed by suicide.[4] Suicide is the leading cause of injury death for Rhode Islanders between the ages of 50 and 64, and falls are the leading cause of injury death for those 65+ (Table 3).[4] Senior Rhode Islanders have the highest rate of fall-related mortality compared to all other age groups. Individuals over the age of 65 represent 14% of Rhode Island's population, yet they account for 87.3% of all fall-related mortality.[4,6]

Leading Causes of Injury-related Hospitalization:

Each year, more than 5,000 Rhode Islanders are hospitalized due to injury.[5] For individuals under the age of 40, injuries are the leading cause of hospitalization.[5] Unintentional falls are the leading cause of injury-related hospital admission for Rhode Islanders (Figure 3).[5] More than 50% of the top 10 leading causes of injury hospitalization are the result of a fall (Figure 3). Falls are also the leading cause of injury hospitalization for both sexes, all racial groups (included in this analysis), and for Rhode Islanders aged 14 and younger and 45+ (Tables 4,5,6).[5] The overwhelming majority of fall-related hospitalizations occur among elder

Figure 3



Data Source: Rhode Island Hospital Discharge Data, 1999-2003, Center for Health Data and Analysis, HEALTH

females. Among individuals over the age of 65, females account for 77.2% of all fall injury hospitalizations in Rhode Island. [5]

MVC are the leading cause of injury hospitalization for Rhode Island youth aged 15-24 years and the 2nd leading cause of injury hospital admissions for males (Table 4,5). Compared to young females, young men have a higher proportion of hospitalizations for MVC, accounting for 61.2% of all MVC hospitalizations among individuals 15 to 24 years old.[5]

Self-harm is the 2nd leading cause of injury related hospitalization for Rhode Island females and youth between the ages of 15 and 24 (Tables 4,5). Females are over-represented among youth hospitalized for a self-inflicted injury, representing roughly 62% of all self-harm hospital admissions for 15 to 24 year olds.[5]

Table 4

Leading Causes of Injury Related Hospitalization among Rhode Islanders Aged 0-24, 1999-2003

	≤14	15-19	20-24
	Total	Total	Total
1	Falls 905	Motor Vehicle Traffic 401	Motor Vehicle Traffic 463
2	Motor Vehicle Traffic 291	Self-harm 357	Self-harm 356
3	Struck by 212	Falls 204	Assault 249

Data Source: Rhode Island Hospital Discharge Data, 1999-2003; Center for Health Data and Analysis, HEALTH

Racial differences in injury hospitalization are presented in Table 6. Falls are the leading cause of injury hospital admission for racial/ethnic groups included in this analysis.

Table 5

Leading Causes of Injury Related Hospitalization by Sex

	Male	Female
	Total	Total
1	Falls 4,189	Falls 7,444
2	Motor Vehicle Traffic 1,876	Self-harm 1,721
3	Self-harm 1,267	Motor Vehicle Traffic 1,256
4	Assault 956	Environmental 339
5	Struck by 606	Unintentional Poisoning 324

Data Source: Rhode Island Hospital Discharge Data, 1999-2003; Center for Health Data and Analysis, HEALTH

Table 6

Leading Causes of Injury Related Hospitalization by Race

	Non-Hispanic Whites	Non-Hispanic Blacks	Hispanic
	Total	Total	Total
1	Falls 10,156	Falls 327	Falls 321
2	Motor Vehicle Traffic 2,418	Assault 259	(2 Tied for 2nd) Assault / Motor Vehicle Traffic 251
3	Self-Harm 2,236	Motor Vehicle Traffic 204	
4	Struck by 656	Self-Harm 147	Self-Harm 168
5	Assault 584	Struck by 52	Fire / Burn 71

Data Source: Rhode Island Hospital Discharge Data, 1999-2003; Center for Health Data and Analysis, HEALTH

Highlights

For individuals under the age of 40, injuries are the leading cause of hospitalization in Rhode Island.

Of the top 10 leading causes of injury hospitalization in Rhode Island, falls account for over 50% of all cases.

Falls are the leading cause of injury hospital admissions for both sexes, all races, and individuals under the age of 14 and over the age of 45.

Motor vehicle traffic accidents are the leading cause of injury hospitalization for Rhode Island youth between the ages of 15 and 24.

Self harm is the 2nd leading cause of injury-related hospitalization for Rhode Island females and youth between the ages of 15-24.

INJURY PREVENTION IN RHODE ISLAND

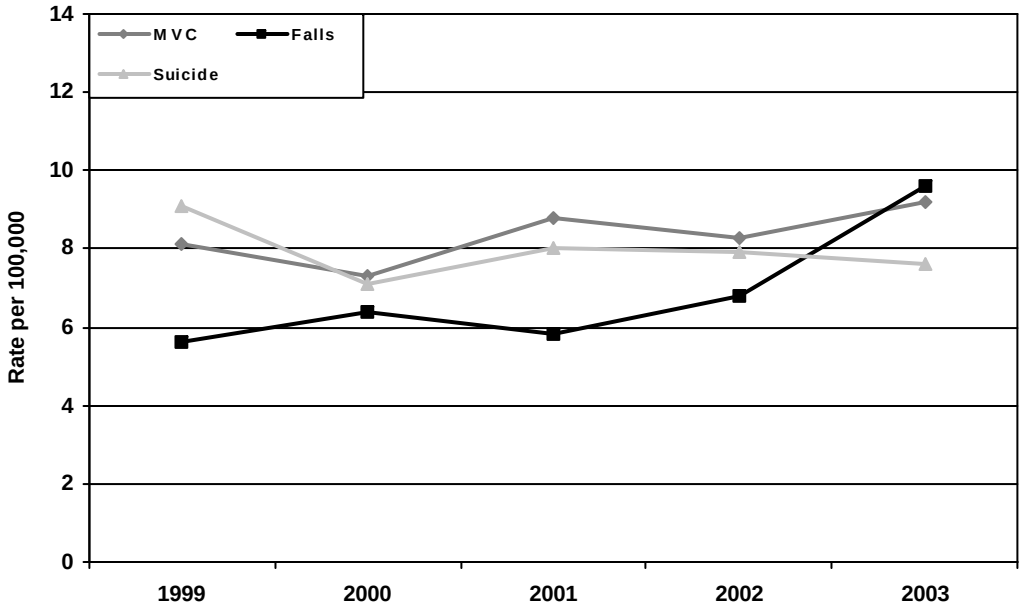
Top Three Priority Prevention Areas:

In 2003, former HEALTH Director, Dr. Patricia A. Nolan, established the Rhode Island Injury Advisory Council (IAC). The IAC was charged with two tasks: setting state level priorities for preventing injuries and guiding the development of a state injury prevention plan that reflects statewide, population-based recommendations. Using a data driven approach, Safe RI in collaboration with the IAC, identified the top three injury prevention priority areas based on information derived from state-level injury data sources. The three prevention focus areas identified are: unintentional falls, unintentional motor-vehicle crashes, and suicide/self-harm, which combined account for the majority of injury-related morbidity and mortality in the state (Figure 2, 3). For years 1999-2003, the age-adjusted death rates for MVC is 8.3 per 100,000 Rhode Islanders; for suicide, 7.9 per 100,000 Rhode Islanders; and for falls, 6.9 per 100,000 Rhode Islanders.[4]

The Rhode Island age-adjusted fall death rate (6.9/100,000) is roughly 20% higher than that of the national rate (5.3/ 100,000).[2] The fall death rate appears to be growing. From 1999 to 2003, falls experienced the greatest rate increase among Safe RI's three injury priority areas, rising from 5.6/100,000 in 1999 to 9.6/100,000 in 2003, a statistically significant difference (Figure 4). While not statistically significant, the MVC death rate also increased slightly from 8.1/100,000 in 1999 to 9.2/100,000 in 2003 (Figure 4). Suicide rates have shown a more encouraging trend over time decreasing from 9.1/100,000 in 1999 to 7.6/100,000 in 2003 (Figure 4). Nationally, the trend in MVC and suicide deaths have remained steady during the years 1999 - 2003.

Figure 4

Suicide, Motor Vehicle Crashes, and Fall Age Adjusted Death Rates by Year, Rhode Island, 1999-2003



Data Source: Rhode Island Vital Statistics Data, 1999-2003; Office of Vital Records / Center for Health Data and Analysis; HEALTH

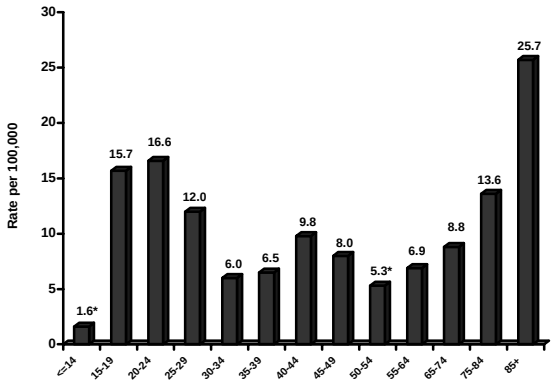
MOTOR VEHICLE CRASH INJURIES

Annually, an average of over 90 people are killed on the state's roads.[4] Many more than that are hospitalized due to a traffic-related injury.[5] The economic burden of motor vehicle crashes in Rhode Island is considerable, with costs reaching almost one billion dollars during the year 2000.[7]

Although motor vehicle crashes (MVC) have a significant impact on the health of all Rhode Islanders, the greatest impact is felt by those between the ages of 15 and 24, and individuals over the age of 85 (Figure 5,6). Rhode Islanders over the age of 85 experience the highest rate of MVC death (25.7/100,000) (Figure 5). State residents in this age group have an MVC death rate roughly three times higher than that of the general population.[4] Rhode Island hospitalizations due to MVC-related injuries were most common among younger age groups. Individuals aged 20 to 24 have the highest rate of traffic injury hospitalization at 120.0/100,000, followed by those aged 15 to 19 (114.6/100,000) (Figure 6). Rates are particularly elevated for men in these age groups. Rhode Island males account for over 66% of all MVC hospitalizations among individuals aged 20-24.[4,5] Overall, men have a motor vehicle death rate more than twice that of women (12.1 vs. 5.1/100,000), and have consistently higher MVC death and hospitalization

Figure 5

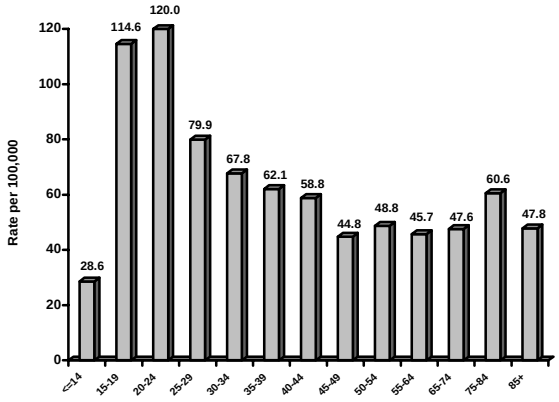
Motor Vehicle Traffic Death Rates by Age, Rhode Island, 1999-2003



Data Source: Rhode Island Vital Statistics Data, 1999-2003; Office of Vital Records / Center for Health Data and Analysis; HEALTH

Figure 6

Motor Vehicle Traffic Hospitalization Rates by Age, Rhode Island, 1999-2003



Data Source: Rhode Island Hospital Discharge Data, 1999-2003; Center for Health Data and Analysis, HEALTH

Highlights

Compared to all other ages, Rhode Islanders over the age of 85 have the highest death rate due to motor vehicle crashes.

Rhode Island males account for over 66% of all MVC hospitalizations in Rhode Island and almost 85% of MVC deaths among Rhode Island residents aged 20-24.

Non-Hispanic Black Rhode Islanders have the highest rate of death due to motor vehicle crashes compared to Non-Hispanic Whites, and Hispanics.

In 2003, Rhode Island had the highest percentage of alcohol-related motor vehicle fatalities in the country.

rates across almost every age grouping.[4,5]

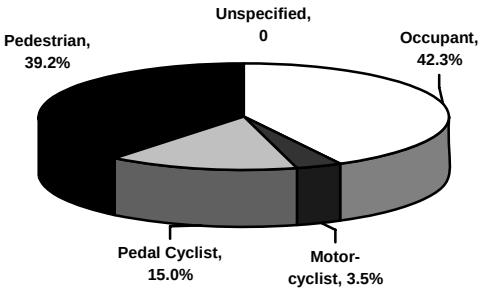
There are noticeable racial differences in traffic injuries as well. Non-Hispanic Blacks have the highest age-adjusted MVC death rate (12.4/100,000), followed by Non-Hispanic Whites (8.4/100,000), and Hispanics (6.5/100,000).[4] Although total numbers are small (N=25), from 1999-2003, roughly one-third of MVC deaths among Non-Hispanic Blacks occurred among youth aged 15-24.[4]

Overall, motor vehicle occupants account for just over 60% of MVC deaths and roughly 67% of MVC hospitalizations.[4,5] Compared to individuals aged 15 and older, Rhode Island children under the age of 14 suffer fewer MVC injuries as motor vehicle occupants (42.3% vs. 74.2%) and considerably more MVC pedestrian injuries (39.2% vs. 13.3%) and MVC pedal cyclist injuries (15.0% vs. 1.3%) (Figure 8,9).

There are a myriad of factors that increase the risk for a traffic accident and/or sustaining a traffic-related injury. According to the National Highway Safety Transportation Administration, seat belt use can reduce the risk of sustaining a fatal MVC injury by 45%.[7] In Rhode Island, during the year 2003, a full 65% of all motor vehicle occupant deaths among individuals ages 5 and older involved an unrestrained motorist (Figure 10). Alcohol impairment is another factor that substantially increases the risk of a traffic-related injury. In 2003, Rhode Island had the highest proportion of alcohol-related fatal MVC in the country.[7] A full 50% of Rhode Island motor vehicle occupants involved in a fatal MVC had a Blood Alcohol Content (BAC) of .08 units or higher, compared to 34% of motor vehicle occupants nationally.[7] Lastly, driving over the speed limit has also been shown to increase the risk for MVC injuries. Compared to the United States as a whole, Rhode Island also has an high percentage of speed-related fatal accidents (US 31% vs. RI 52%).[7] While the proportion of speed-related crashes is high in Rhode Island, it is important to note that the RI's speed limits are generally lower than those of other states' given our high population density, and predominantly urban roads.

Figure 8

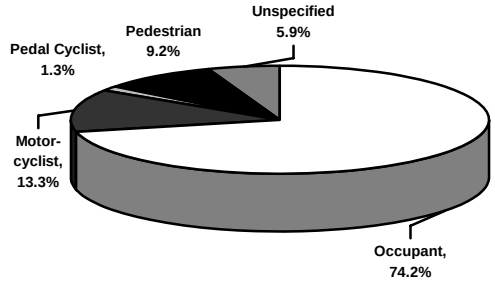
Motor Vehicle Traffic Hospitalizations by Injured Person among Rhode Islanders Aged 0-14, 1999-2003
N=291



Data Source: Rhode Island Hospital Discharge Data, 1999-2003; Center for Health Data and Analysis, HEALTH

Figure 9

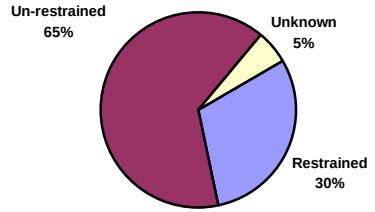
Motor Vehicle Traffic Hospitalzations by Injured Person among Rhode Islanders Aged 15+, 1999-2003
N=2,585



Data Source: Rhode Island Hospital Discharge Data, 1999-2003; Center for Health Data and Analysis, HEALTH.

Figure 10

Restraint Use in Passenger Vehicle Occupant Deaths (age 5 +), Rhode Island 2003

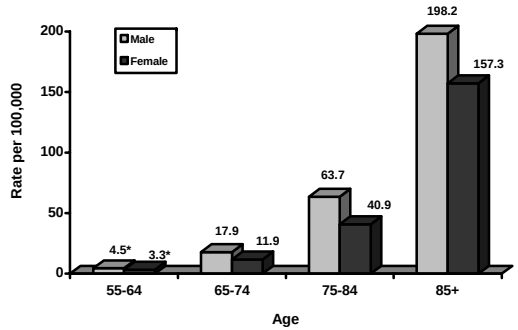


Data Source: Fatality Analysis Reporting System, 2003; National Highway Transportation Safety Administration

ELDER FALL INJURIES

Figure 11

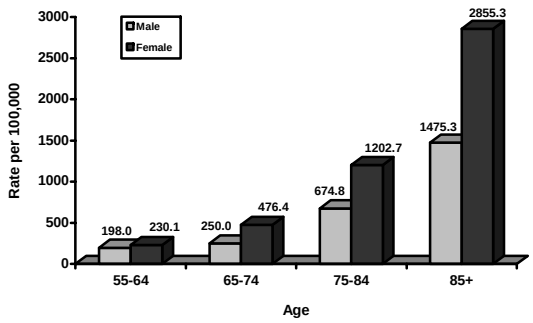
Fall Death Rates among Rhode Islanders Aged 55+ by Sex and Age, 1999-2003



Data Source: Rhode Island Vital Statistics Data, 1999-2003; Office of Vital Records / Center for Health Data and Analysis; HEALTH

Figure 12

Fall Hospitalization Rates among Rhode Islanders Aged 55+ by Sex and Age, 1999-2003



Data Source: Rhode Island Hospital Discharge Data, 1999-2003; Center for Health Data and Analysis, HEALTH

Falls are the second leading cause of injury death for Rhode Islanders and the leading cause of injury hospitalization (Figure 2,3). In Rhode Island, elders have by far the highest rates of fall-related hospitalization and death compared to all other ages.[4,5] Roughly 66% of all accidental deaths among individuals over the age of 65 are due to fall injury.[4] For both sexes, fall death and hospitalization rates increase sharply with age (Figure 11,12). Rhode Islanders over the age of 85 are impacted the most by falls. The fall death rate for individuals in this age group is 168.3/100,000, a rate more than 25 times higher than that of the general Rhode Island population (6.6/100,000).[4]

Compared to females, male Rhode Islanders have higher rates of death due to falls (Figure 11).[4] The fall death rate for Rhode Island males over 85 is roughly 20% greater than that of Rhode Island females in the same age group (Figure 11).[4] Elder females, however, are disproportionately affected by fall-related hospitalizations. Rhode Island females over the age of 85 have a fall injury hospitalization rate nearly double that of same aged Rhode Island men, accounting for 83.8% of all fall-related hospitalizations in this age group[5].

Roughly 25% of elders who sustain a fall-related injury will not survive.[9] Of survivors, another 24% will die within the 12 months following their fall.[9] Hip fracture is the fall-related injury that causes the greatest number of deaths and institutionalizations.[8] Women are particularly susceptible, experiencing 80% of all hip fractures.[8] It is estimated that 18.7% of Rhode Island females 50+ have osteoporosis, substantially increasing their risk of sustaining a fall injury.[10]

Highlights

Roughly 66% of accidental deaths among Rhode Islanders over the age of 65 are due to a fall injury.

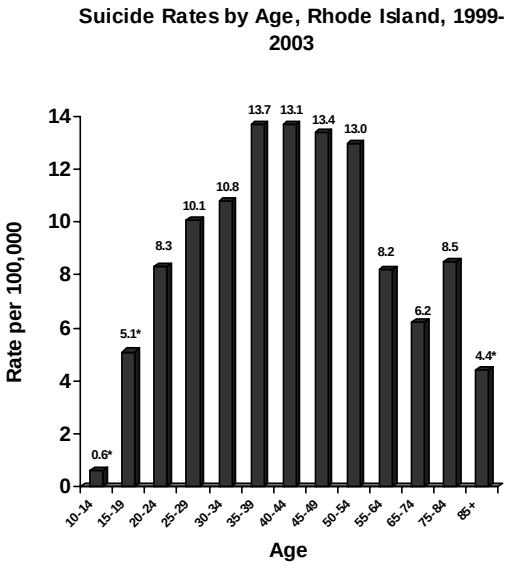
Among Rhode Island elders, males have the highest fall injury death rate, while females have the highest fall injury hospitalization rate.

The fall death rate for Rhode Islanders over the age of 85 is more than 25 times higher than that of the general Rhode Island population.

18% of Rhode Island females over age 50 have osteoporosis, increasing their risk of sustaining a fall-related injury.

SUICIDE AND SELF-HARM

Figure 14



Data Source: Rhode Island Vital Statistics Data, 1999-2003; Office of Vital Records / Center for Health Data and Analysis; HEALTH

Suicide, death by self-harm, is the leading cause of intentional injury death in Rhode Island.[4] Statewide, there are more than twice as many suicides as homicides. Unlike national suicide rates which peak among the elderly, Rhode Island suicide rates peak among individuals between the ages of 35 and 54 (Figure 14). Rhode Island males have a suicide rate more than double that of Rhode Island females (12.1 vs. 5.1/100,000), accounting for 78.5% of all suicides in the state.[4]

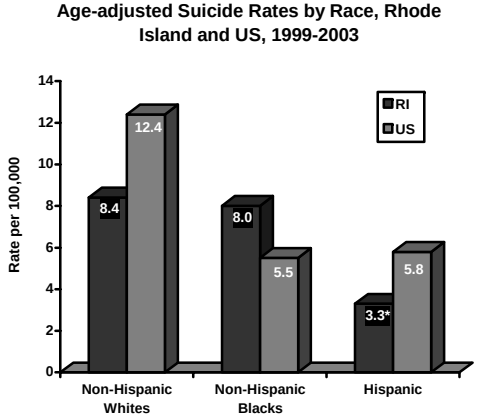
Non-Hispanic Whites have an age-adjusted suicide rate almost three times higher than Hispanics, but only slightly higher than Non-Hispanic Blacks (Figure 15). Non Hispanic Blacks living in Rhode Island have an age-adjusted suicide rate over 30% higher than the national rate for Non-Hispanic Blacks (8.0 vs. 5.5/100,000).[2] However, Non- Hispanic Whites have an age adjusted suicide rate more than 30% Lower than that of the national rate for Non-Hispanic Whites (8.4 vs. 12.4/100,000).[2] For Rhode Island minorities, the greatest proportion of suicides occurs among those aged 25 to 29 years, yet among Non Hispanic Whites the greatest proportion of suicides occurs among those aged 35 to 39 years.[4]

Suffocation is the most common method of suicide in Rhode Island (38.1%), followed by firearm (30.1%), and poisoning (21.2%). In contrast to national statistics, Rhode Island has a much lower percentage of suicide by firearm (US 55.6% vs. RI 30.1%), and a much higher percentage of suicide by suffocation (US 19.7% vs. RI 38.1%).[2,4]

Self-harm is the 3rd leading cause of injury-related hospital admission in Rhode Island (Figure 3). Rhode Island self-harm hospitalization rates are highest among individuals between the ages of 15 and 44, peaking between the ages of 15 to 19 (101.9/100,000) (Figure 17). Unlike suicides, self-harm hospitalization rates are higher for females than for males across every age group.[5] The greatest difference between sexes occur in children under 14, where females account for 71.4% of all self-harm hospitalizations.[5]

Racial patterns in self-harm hospitalization in

Figure 15

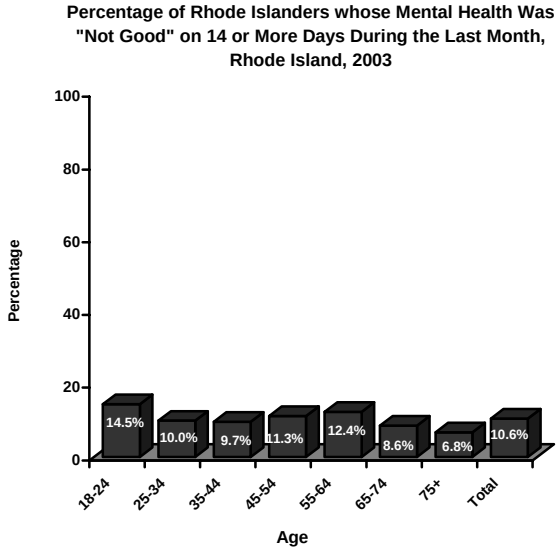


Data Source: Rhode Island Vital Statistics Data, 1999-2003; Office of Vital Records / Center for Health Data and Analysis; HEALTH

Rhode Island differ slightly from patterns in suicide. Non-Hispanic Blacks have the highest rate of hospital admissions for self-harm (59.7/100,000), followed by Non-Hispanic Whites (50.8 /100,000), and Hispanics (36.5 /100,000). [5]

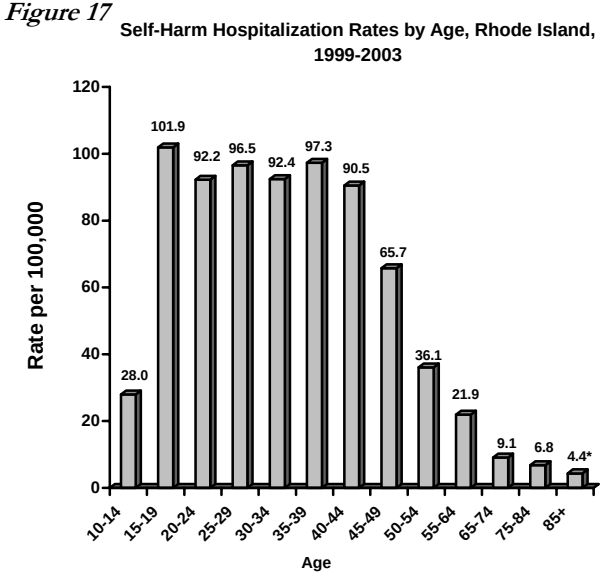
There are a host of factors that make an individual particularly vulnerable to suicide and self-harm. According to the Surgeon General's Call to Action to Prevent Suicide, one of the greatest risk factors for suicide is a mental health disorder. [11] In 2003, 10.6% of Rhode Island adults (18+) suffered from 14 or more days of poor mental health in the month preceding their participation in the Behavioral Risk Factor Survey (Figure 16). [12] During the same time period, a full 24.3% of Rhode Island high school students reported feeling so sad or hopeless, almost every day for at least two weeks, that they stopped doing some of their usual activities and 14.1% seriously considered attempting suicide. [13] Although these are not measures of a mental health disorder per se, these estimates illustrate that poor mental health / suicidal ideation among Rhode Islanders is an issue that deserves attention, especially among younger age groups.

Figure 16



Data Source: Behavioral Risk Factor Survey, 2003, Center for Health Data and Analysis, HEALTH

Figure 17



Data Source: Hospital Discharge Data, 1999-2003; Center for Health Data and Analysis, HEALTH

Highlights

Suicide is the leading cause of intentional injury death in Rhode Island. There are more than twice as many suicides compared to homicides in Rhode Island.

The most common method of suicide in Rhode Island is suffocation.

The Non-Hispanic Black population in Rhode Island has a rate of suicide 30% higher than that of the national suicide rate for Non-Hispanic Blacks.

Rhode Island's rate of self-harm hospitalization peaks among youth aged 15 to 19.

Rhode Island's suicide rate is highest among those aged 35 to 54.

CONCLUSION

Injuries are the 5th leading cause of death for Rhode Islanders of all ages and the leading cause of death for Rhode Islanders aged 1-34 years[4]. This report demonstrates that the burden of injury in Rhode Island is considerable. We have tried to illustrate the magnitude of this problem as comprehensively as possible through the use of injury mortality, hospitalization, and selected risk factor data. Currently, in Rhode Island, there are some gaps in injury data reporting. However, the recent development of state-level injury data sources such as the Emergency Department Database and the National Violent Death Reporting System will allow us to greatly improve our assessment of statewide injury morbidity and mortality in the future.

The well-established state-level injury data sources utilized for this report are integral in informing statewide injury prevention planning efforts. A strategic plan for Injury Prevention in Rhode Island was created in August of 2005. Recommendations throughout the plan are based upon the most recent information available about the victims and consequences of injury in Rhode Island. The Safe Rhode Island Injury Prevention Plan, which is already having an impact on Rhode Island's injury prevention and control effort, sets forth priorities, target populations and measurable goals for the prevention of motor vehicle/transportation injury, fall injury, and suicide/self-harm, and identifies task forces comprised of interested and excited community partners willing to work with public health to reduce the incidence of injury in our state. Sustained injury surveillance is essential to evaluate the effectiveness of state injury prevention interventions, and to measure the extent of their impact on the health and safety of Rhode Islanders.

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APPENDIX

Table A

Injury Deaths, Rhode Island, 1999 – 2003 (N=2,479)

	Intent				
Mechanism/Cause	Unintentional	Self-inflicted	Assault	Undetermined	**Total**
Cut/Pierce	0	9	26	0	35
Drowning	39	15	4	6	64
Fall	442	15	0	3	460
Fire/Burn	107	0	0	4	111
Firearm	1	129	114	2	246
Machinery	4	0	0	0	4
Motor Vehicle Traffic	457	0	1	0	458
Pedal cyclist, other	4	0	0	0	4
Pedestrian, other	14	0	0	0	14
Transport, other	28	0	5*	0	33
Environmental	25	0	0	0	25
Poisoning	50	90	0	393	533
Struck by	15	0	0	1	16
Suffocation	115	164	4	5	288
Classifiable	22	1	0	2	25
Not Classifiable	27	4	5	3	39
Unspecified	91	2	25	6	124
Total	1,441	429	184	425	***2,479***

*Acts of terrorism

Data Source: Rhode Island Vital Statistics Data, 1999-2003; Rhode Island Department of Health, Office of Vital Records / Center for Health Data and Analysis

Table B

MVC Deaths by Age and Gender, Rhode Island, 1999 – 2003 (N=457)

	Male		Female		
Age	N	% (of total)	N	% (of total)	**Total**
≤14	4	0.9	14	3.1	18
15-19	40	8.7	15	3.4	55
20-24	56	12.3	10	2.2	66
25-29	32	7.0	8	1.8	40
30-34	20	4.4	2	0.4	22
35-39	21	4.6	6	1.3	27
40-44	33	7.2	10	2.2	43
45-49	24	5.3	9	2.0	33
50-54	15	3.4	3	0.4	18
55-64	20	4.4	13	2.8	33
65-74	17	3.7	15	3.3	32
75-84	18	3.9	23	5.0	41
85+	13	2.8	16	3.5	29
Total	**313**		**144**		**457**

Table C

MVC Deaths by Race, Rhode Island, 1999 – 2003 (N=456)

Race/Ethnicity	**N**	**%**
Non-Hispanic White	390	85.5
Non-Hispanic Black	25	5.5
Hispanic	29	6.4
Non-Hispanic Am. Indian / AK Native	1	0.2
Non-Hispanic Asian / Pac Islander	11	2.4
Total	456	100

Data Source: Rhode Island Vital Statistics Data, 1999-2003; Rhode Island Department of Health, Office of Vital Records / Center for Health Data and Analysis

Table D

MVC Hospitalizations by Age and Gender, Rhode Island, 1999 – 2003 (N=3,132)

	Male		Female		
Age	N	% (of total)	N	% (of total)	**Total**
≤14	184	5.9	107	3.4	291
15-19	222	7.1	179	5.7	401
20-24	307	9.8	156	5.0	463
25-29	172	5.5	88	2.8	260
30-34	164	5.2	86	2.7	250
35-39	164	5.2	95	3.0	259
40-44	170	5.4	86	2.7	256
45-49	119	3.8	55	1.8	174
50-54	92	2.9	73	2.3	165
55-64	123	3.9	90	2.9	213
65-74	83	2.7	85	2.7	168
75-84	61	1.9	117	3.7	178
85+	15	0.5	39	1.2	54
Total	1,876		1,256		3,132

Table E

MVC Hospitalizations by Race / Ethnicity, Rhode Island, 1999 – 2003 (N=3,049)

Race/Ethnicity	**N**	**%**
Non-Hispanic White	2,418	79.3
Non-Hispanic Black	204	6.7
Hispanic	251	8.2
Non-Hispanic Am. Indian / AK Native	10	0.3
Non-Hispanic Asian / Pac Islander	58	1.9
Non-Hispanic Other	108	3.5
Total	3,049	100

Data Source: Rhode Island Hospital Discharge Data, 1999-2003; Rhode Island Department of Health, Center for Health Data and Analysis

Table F

Fall Deaths among Rhode Islanders aged 50 +, by Age and Gender, Rhode Island, 1999 – 2003 (N=413)

	Male		Female		
Age	N	% (of total)	N	% (of total)	**Total**
50-54	8	1.9	1	0.2	9
55-64	10	2.4	8	1.9	18
65-74	27	6.5	23	5.6	40
75-84	72	17.4	74	17.9	146
85+	61	14.8	129	31.2	190
Total	178		235		413

Table G

Fall Deaths among Rhode Islanders 50+, by Race / Ethnicity, 1999 – 2003 (N=412)

Race/Ethnicity	**N**	**%**
Non-Hispanic White	398	96.6
Non-Hispanic Black	8	1.9
Hispanic	4	1.0
Non-Hispanic Am. Indian / AK Native	0	0
Non-Hispanic Asian / Pac Islander	2	0.5
Total	412	100

Data Source: Rhode Island Vital Statistics Data, 1999-2003; Rhode Island Department of Health, Office of Vital Records / Center for Health Data and Analysis

Table H

Fall Hospitalizations among Individuals aged 50+, by Age and Gender, Rhode Island, 1999 – 2003 (N=8,532)

	Male		Female		
Age	N	% (of total)	N	% (of total)	**Total**
50-54	244	2.9	233	2.7	477
55-64	440	5.2	561	6.6	1,001
65-74	389	4.6	926	10.9	1,315
75-84	763	8.9	2,178	25.5	2,941
85+	454	5.3	2,344	27.4	2.798
Total	2,290		6,242		8,532

Table I

Fall Hospitalizations among Individuals aged 50+, by Race / Ethnicity, Rhode Island, 1999-2003 (N=8,203)

Race/Ethnicity	**N**	**%**
Non-Hispanic White	7,760	94.6
Non-Hispanic Black	122	1.5
Hispanic	77	0.9
Non-Hispanic Am. Indian / AK Native	82	1.0
Non-Hispanic Asian / Pac Islander	41	0.5
Non-Hispanic Other	121	1.5
Total	8,203	100

Data Source: Rhode Island Hospital Discharge Data, 1999-2003; Rhode Island Department of Health, Center for Health Data and Analysis

Table J

Suicide by Age and Gender, Rhode Island, 1999 – 2003 (N=428)

	Male		Female		
Age	N	% (of total)	N	% (of total)	**Total**
≤14	2	0.5	0	0	2
15-19	15	3.5	5	1.2	20
20-24	27	6.3	7	1.6	44
25-29	26	6.0	7	1.6	43
30-34	32	7.5	8	1.9	40
35-39	44	10.3	13	3.0	57
40-44	42	9.8	14	3.3	56
45-49	41	9.6	11	2.6	52
50-54	38	8.9	6	1.4	44
55-64	29	6.8	8	1.9	37
65-74	19	4.4	4	0.9	23
75-84	18	4.2	7	1.6	25
85+	3	0.7	2	0.5	5
Total	336		92		428

Table K

Suicide by Race / Ethnicity, Rhode Island, 1999-2003 (N=426)

Race/Ethnicity	**N**	**%**
Non-Hispanic White	383	89.9
Non-Hispanic Black	20	4.7
Hispanic	16	3.8
Non-Hispanic Am. Indian / AK Native	1	0.2
Non-Hispanic Asian / Pac Islander	6	1.4
Total	426	100

Data Source: Rhode Island Vital Statistics Data, 1999-2003; Rhode Island Department of Health, Office of Vital Records / Center for Health Data and Analysis

Table L

Self-Harm Hospitalization, by Age and Gender, Rhode Island, 1999 – 2003 (N=2,811)

	Male		Female		
Age	N	% (of total)	N	% (of total)	**Total**
≤14	32	1.1	80	2.8	112
15-19	122	4.3	235	8.4	357
20-24	152	5.4	204	7.3	356
25-29	131	4.7	183	6.5	314
30-34	127	4.5	214	7.6	341
35-39	149	5.3	257	9.1	406
40-44	167	5.9	222	7.9	389
45-49	93	3.3	162	5.8	255
50-54	55	2.0	67	2.4	122
55-64	40	1.4	62	2.2	102
65-74	12	0.4	20	0.7	32
75-84	8	0.3	12	0.4	20
85+	2	0.08	3	0.1	5
Total	923		1,499		2,811

Table M

Self-Harm Hospitalization, by Race / Ethnicity, Rhode Island, 1999 – 2003 (N=2,708)

Race/Ethnicity	**N**	**%**
Non-Hispanic White	2,236	82.6
Non-Hispanic Black	147	5.4
Hispanic	168	6.2
Non-Hispanic Am. Indian / AK Native	26	1.0
Non-Hispanic Asian / Pac Islander	54	2.0
Non-Hispanic Other	77	2.8
Total	2,708	100

Data Source: Rhode Island Hospital Discharge Data, 1999-2003; Rhode Island Department of Health, Center for Health Data and Analysis

Table N

Leading Causes of Injury Related Death by Age, Rhode Island, 1999 – 2003

	≤14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-64	65-74	75-84	85+
	Total	**Total**	**Total**	**Total**	**Total**	**Total**	**Total**	**Total**	**Total**	**Total**	**Total**	**Total**	**Total**
1	Motor Vehicle Traffic 16	Motor Vehicle Traffic 55	Motor Vehicle Traffic 64	Motor Vehicle Traffic 39	Undetermined Poisoning 49	Undetermined Poisoning 72	Undetermined Poisoning 101	Undetermined Poisoning 66	Suicide 44	Suicide 38	Falls 51	Falls 146	Falls 190
2	Suffocation 13	Homicide 31	Homicide 34	Suicide 33	Suicide 40	Suicide 57	Suicide 56	Suicide 52	Undetermined Poisoning 25	Motor Vehicle Traffic 32	Motor Vehicle Traffic 31	Motor Vehicle Traffic 40	Suffocation 39
3	Homicide 12	Suicide 18	Suicide 32	Homicide 29	Motor Vehicle Traffic 22	Motor Vehicle Traffic 27	Motor Vehicle Traffic 42	Motor Vehicle Traffic 31	Motor Vehicle Traffic 18	Falls 18	Suicide 22	Suffocation 27	Motor Vehicle Traffic 29
4	Fire/Burn 11	Undetermined Poisoning 9	Undetermined Poisoning 20	Undetermined Poisoning 29	(2 Tied for 4th) Homicide / Fire/Burn 17	Homicide 22	Homicide 12	Falls 15	(2 Tied for 4th) Homicide/Falls 9	Undetermined Poisoning 17	Suffocation 8	Suicide 25	Fire/Burn 8
5	Undetermined, Other 6	*Drowning* *<5*	Undetermined, Other 5	Fire/Burn 9		Fire/Burn 19	Fire/Burn 10	Homicide 6	Drowning 5	Suffocation 9	Struck by 6	Fire/Burn 6	Environmental 7

Data Source: Rhode Island Vital Statistics Data, 1999-2003; Rhode Island Department of Health, Office of Vital Records / Center for Health Data and Analysis

Table O

Leading Causes of Injury-related Hospitalization by Age, Rhode Island, 1999-2003

	≤14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-64	65-74	75-84	85+
	Total	**Total**	**Total**	**Total**	**Total**	**Total**	**Total**	**Total**	**Total**	**Total**	**Total**	**Total**	**Total**
1	Falls 905	Motor Vehicle Traffic 401	Motor Vehicle Traffic 463	Self-harm 314	Self-harm 341	Self-harm 406	Falls 494	Falls 474	Falls 477	Falls 1,001	Falls 1,315	Falls 2,941	Falls 2,798
2	Motor Vehicle Traffic 291	Self-harm 357	Self-harm 356	Motor Vehicle Traffic 260	Falls 278	Falls 387	Self-harm 388	Self-harm 255	Motor Vehicle Traffic 165	Motor Vehicle Traffic 213	Motor Vehicle Traffic 168	Motor Vehicle Traffic 178	Motor Vehicle Traffic 54
3	Struck by 212	Falls 204	Assault 249	Falls 177	Motor Vehicle Traffic 250	Motor Vehicle Traffic 259	Motor Vehicle Traffic 252	Motor Vehicle Traffic 174	Self-harm 122	Self-harm 102	Overexertion 57	Overexertion 73	Overexertion 29
4	Fire/Burn 165	Assault 192	Falls 182	Assault 154	Assault 120	Assault 131	Assault 102	Assault 52	Cut / Pierce 36	Environmental 35	Unintentional Poisoning 53	Unintentional Poisoning 43	Environmental 27
5	Environmental 156	Struck by 121	Cut / Pierce 56	Struck by 62	Cut / Pierce 52	Cut / Pierce 73	Struck by 65	Unintentional Poisoning 50	Environmental 35	Overexertion 62	Environmental 47	Struck by 41	Unintentional Poisoning 26

Data Source: Rhode Island Hospital Discharge Data, 1999-2003; Rhode Island Department of Health, Center for Health Data and Analysis

Figure A

Suicide, Motor Vehicle Traffic, and Fall Age Adjusted Death Rates by Year, US, 1999-2003

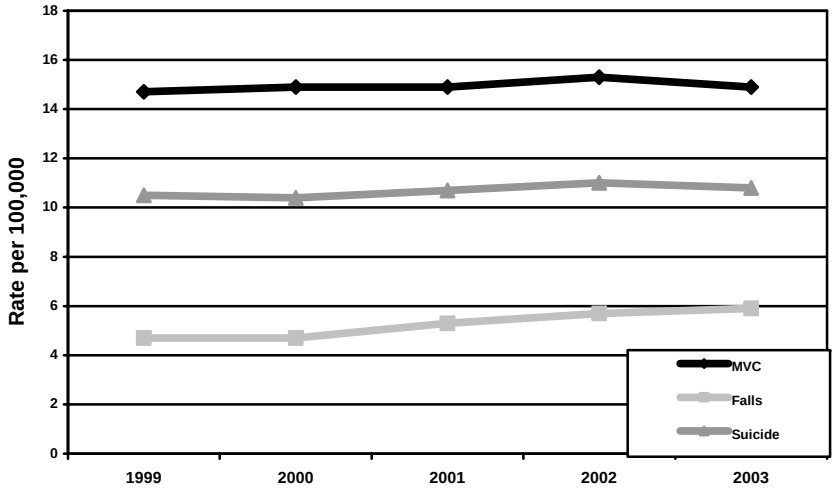


Figure B

Suicide Rates by Age, Rhode Island and US, 1999-2003

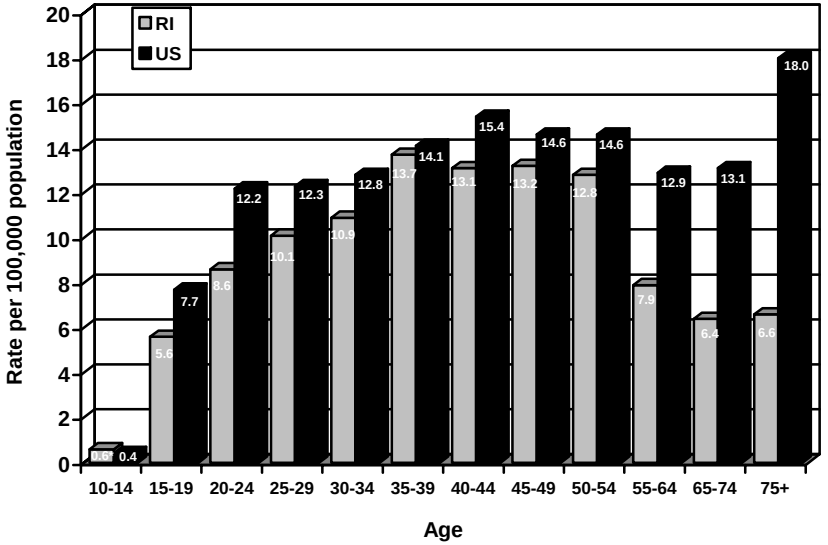


Figure C

Suicide Rates by Race / Ethnicity, US and RI, 1999-2003

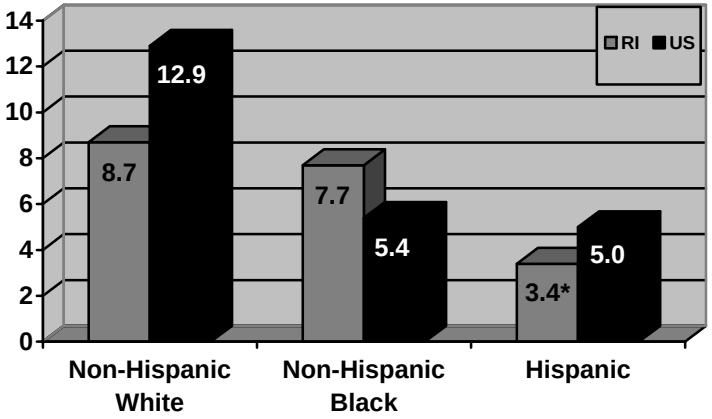
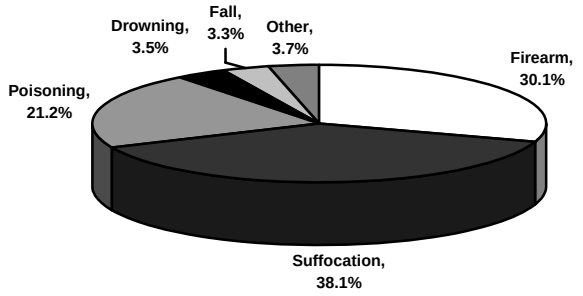


Figure D

Suicide by Method, Rhode Island, 1999-2003 N=428



Data Source: Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. Web-based Injury Statistics Query and Reporting System (WISQARS), 1999-2003